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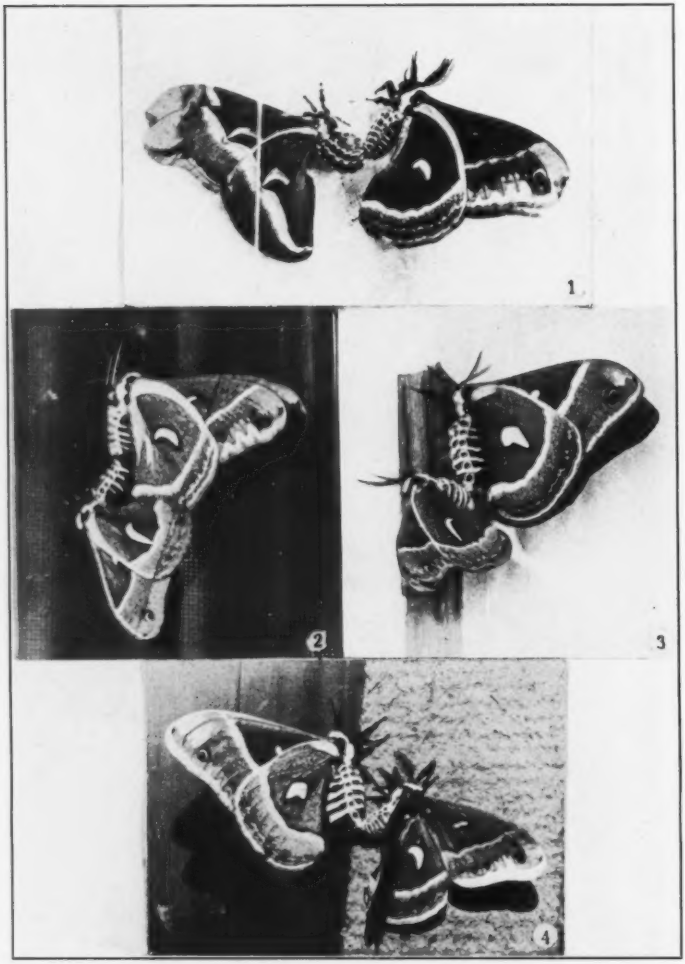

PLATYSAMIA CROSS-MATINGS—SWEADNER

ENTOMOLOGICAL NEWS

VOL. XLV. NOVEMBER, 1934 No. 9

"Species" through Hybridization ? (Lepid.: Saturniidae.)

By WALTER R. SWEADNER, University of Pittsburgh.

(Plate II.)

In their article "Observations in the Genus Samia" in the March 1933, issue of ENTOMOLOGICAL NEWS, the Misses Wickwire and Calale raised a number of questions growing out of the observed cross-mating of species of this genus. The writer has been working on this problem for the past four years and a preliminary report of the results of his investigations may partially answer their questions.

The observation that *Samia* (or *Platysamia*) *gloveri* females readily attract and mate with wild *P. cecropia* males may be extended to include the entire genus and even some members of allied genera. In the Spring of 1931 the writer crossed females of *Platysamia gloveri, P. euraylis* and *P. nokomis* with wild *P. cecropia* males near Slippery Rock, Pennsylvania. In 1932, while studying the zone of contact between *Platysamia curyalis* and *P. gloveri* in Northern Idaho and Western Montana, sixty-one cross matings were secured by using the method of "tying out a female." These crosses included matings of females of *Platysamia cecropia, P. gloveri, P.* hybrid *gloveri-cecropia* and *Callosamia angulifera* with males of the species known as *Platysamia curyalis* variety *kasloensis* (Cockerell) and matings of *P. cecropia* and *P. gloveri* (Utah) females to *P. gloveri* (Montana) males. At Bradley, Montana, in *gloveri* territory, a *P. cecropia* female was mated to a *P. gloveri* male while a *P. gloveri* female a few feet away remained unmated. The *gloveri-cecropia* males were mated to their sisters or backcrossed to both parent species. In 1933 a similar survey was made in Michigan, Manitoba and Ontario. Twenty-two matings were secured using *P. cecropia* and *P. gloveri* females and

wild *P. columbia* and *P. nokomis* males. A few miles west of Winnipeg, a pair of *P. cecropia* females, tied to the same bush, mated to a *P. cecropia* and a *P. nokomis* male on the same night. Similarly, *P. cecropia* females mated with both *P. cecropia* and *P. columbia* males near North Bay, Ontario. The larvae from these two hybrid matings were among those successfully reared. The imagos showed a greater variability than the previously produced hybrids. The females were sterile but the males, mated to *P. cecropia* females, produced normal, healthy, but extremely variable larvae that are now hibernating as pupae. In about seventy per cent of all the above crosses the eggs were fertilized, although in some of the species crosses, in the *Callosamia angulifera-Platysamia kasloensis* cross and in all of the matings involving hybrid females, the embroyos developed part way but failed to hatch.

Two zones of contact between the various species of the genus *Platysamia* have been established for a relatively long time, namely: the home of *Platysamia euryalis* var. *kasloensis* in Northern Idaho, Western Montana and Southern British Columbia, a zone of contact between *P. euryalis* and *P. gloveri;* and in Northern Michigan, Manitoba, Ontario, Quebec and Maine, a zone of contact between *Platysamia nokomis* or *P. columbia* (both offshoots of *P. gloveri*) and *P. cecropia.* In recent years *P. cecropia* has invaded the territory of *P. gloveri* in Colorado, probably having been assisted in crossing the Great Plains by the tree-planting activities of the settlers. This invasion, reported by Dr. T. D. A. Cockerell, should be carefully studied by someone in that district.

Judging from the ease with which crosses have been secured in Nature, it may be inferred that the species of the genus *Platysamia* inter-breed freely in the zones of contact. The females of the hybrids as yet produced have proven sterile, but the males are fertile when crossed back to either of the parent species. The intergradation derived from such back-crossing is well illustrated by a series of thirty males taken at Lookout Pass in the Bitterroot Mountains on the Idaho-Montana state

line. These intergrades range from a slightly aberrant *P. gloveri* to almost typical *P. curyalis*. A series of eighty-four specimens taken in this zone of contact shows a continuous trimodal distribution ranging from moths taken along the Continental Divide showing mostly *gloveri* characters to specimens from near the Washington state line having mostly *curyalis* characters. Many of these wild intergrades, particularly the mid-intergrades, have been matched exactly in form and color by primary hybrids between *P. curyalis* and *P. gloveri*. In the *cecropia-nokomis* and *cecropia-columbia* contacts there were no intergrades found, but about half of both *P. columbia* and *P. nokomis* show color characters that can be explained most conveniently on the basis of a trace of *cecropia* ancestry. This lack of intergradation indicates that *cecropia* has been separated from the *gloveri-columbia-nokomis* group longer than has *curyalis* in spite of the latter's greater divergence. The lack of intergrades also indicates weak or infertile primary hybrids which should have a diminishing effect on both species. The almost complete extinction of *P. columbia* east of Lake Superior is due largely to the destruction of its food plant by the larch sawfly, but it is interesting to note that *P. nokomis* occupies only a small part of the northern range of its food plant (*Elacagnus*), the southern portion being exclusively occupied by *P. cecropia*. Either the presence of *P. cecropia* prevents the invasion of the territory by *P. nokomis* through crossing with it, or the former has driven out the latter by the same process as it advanced northward. If the second alternative is true, both *P. nokomis* and *P. columbia* and possibly *P. gloveri* are doomed to extinction.

The characters introduced into a species by a single alien specimen would soon be swamped. The collection of Mr. J. W. Sugden, of Salt Lake City, contains a specimen that emerged in 1927 from a *gloveri* type cocoon collected in that city that has the appearance of a primary hybrid between a *P. gloveri* female and a *P. cecropia* male (the reciprocal crosses produce slightly different hybrids). From a batch of cocoons collected

in the same territory in the Spring of 1932 there emerged a specimen showing a slight trace of *cecropia* characters.

The present distribution of the *Platysamia* and the different degrees of intergradation at the points of contact indicate to a certain extent the origin of the species. I would suggest that during the Ice Age the genus existed as two probably homogenous groups:* the progenitors of *P. cecropia* in the southeast in the pocket formed by the ice sheet and the very wide Mississippi River at that time; and the ancestors of *P. euryalis, P. gloveri, P. nokomis* and *P. columbia* in Northern Mexico. Following the retreat of the glaciers, this latter group became separated into *P. euryalis* and *P. gloveri* by the deserts of the Great Basin, while *P. cecropia* continued its isolation due to the barrier of the treeless plains. *Nokomis* and *columbia* became separated from *gloveri* by food plant specialization after that species reached Canada.

EXPLANATION OF PLATE II.

Some of the Cross Matings.

Fig. 1. *Philosamia cynthia* ♀ × *Platysamia cecropia* ♂
Fig. 2. *P. euryalis* ♀ × *P. cecropia* ♂
Fig. 3. *P. gloveri* ♀ × *P. euryalis* ♂
Fig. 4. *Platysamia gloveri* ♀ × *P. cecropia* ♂

Two New Species of the Genus Hydrellia from Mount Desert, Maine (Diptera : Ephydridae).

By EZRA T. CRESSON, JR., Philadelphia, Penna.

The species of this genus appear to be leaf-miners and there are records of their mining the leaves of grasses and various aquatic plants. In North America we have *H. scapularis* Loew reported as a serious miner of rice in California.[1] Miss Emmeline Moore[2] reared a species of this genus from *Potamogeton*, pond-weed, which may be *H. cruralis* Coq. and which species I have before me, reared by Miss Gertrude Auxier from the same plant at Marlington, West Virginia. Others, *H.*

* There is a possibility that *euryalis* was isolated during the Ice Age.
[1] Jour. Econ. Ent., XV, p. 432, (1922).
[2] U. S. Bur. Fisheries Bull., XXXIII, pp. 259-291, (1915).

griseola Fab. and *leucostoma* Meig., have been reported in Europe from grasses and other plants. The following species add two more to the list of the known habitats of North American species.

Hydrellia proctori new species.

Similar to *H. cruralis* Coq., but the third antennal segment and the tibiae are black and the general color is darker than in that species.

Palpi and all tarsi tawny. Haltere knobs pale lemon-yellow. Wings hyaline with dark veins.

Frons uniformally opaque, not velvety, black to dark ochraceous, depending upon the aspect, but at no time showing any demarcation of the frontalia. Face, lunule and cheeks evenly dark ochraceous; lower occiput more grayish. Mesonotum including humeri, notopleura, scutellum and metanotum, black, subopaque, overcast with brown, somewhat of olive tone. Pleura grayish, color sharply limited at notopleural suture. Abdomen concolorous with mesonotum, not grayish laterally, becoming slightly ochreous gray ventrally. Femora and tibiae grayish.

Frons much broader than long; lunule well developed; anteocellar distance slightly greater than that between anterior ocellus and post-ocellar bristles; latter bristles very strong. The two frontorbitals subequal in length, the posterior one caudolaterally inclined. Face scarcely one-third width of head, in profile vertical and weakly convex; parafacialia linear; facialia rather marked, about twice as broad as the parafacialia, with about six long, thin up-curved bristles, the two uppermost above line of buccal orbit; cheeks scarcely as broad as third antennal segment. The latter slightly longer than broad; arista with six hairs. Mesonotum with about fourteen pairs of acrostichals; the two pairs of dorsocentrals widely separated, forming a quadrangle. Scutellum flat, triangular with four marginals. Abdomen ovate with convex lateral margins; segments two to four subequal or four slightly the longest; fifth acutely triangular, slightly longer than fourth. Hypopygium small, about twice as long as broad. Legs normal. Wings with third costal section slightly longer than second.

Length, 2.5 to 2.7 mm.

Type.—Male; Bar Harbor, Mt. Desert, MAINE, May 7, 1933. (William Proctor; on *Nymphaea advena.* [A.N.S.P., no. 6152]

Paratype.—1 ♂; Topotypical.

Hydrellia advenae new species.

In general color and structure this species is similar to *H. serena* Cresson, but much smaller, lunule smaller, anteocellar distance longer, face broader and flatter with yellowish tone, arista with fewer hairs, mesonotum and abdomen more olivaceous and not so shining, the dark color of mesonotum but slightly enroaches onto the mesopleura.

Palpi and bases of tarsi tawny. Haltere knob pale lemon-yellow. Wings sub-hyaline with black veins.

Frons uniformly opaque black to slightly grayish, depending upon the aspect, leaving small wedges of the frontalia and sometimes the parafrontals black. Face and lunule somewhat golden becoming whitish above and laterally including cheeks. Mesonotum including humeri, notopleura, scutellum and metanotum, uniformly subopaque dark grayish olive. Pleura contrastingly paler, more grayish. Abdominal dorsum concolorous with mesonotum; venter concolorous with pleura. Fore coxae, femora and tibiae whitish gray.

Frons broader than long, depressed at antennae, lunule very small with anteocellar distance much greater than distance between anteocellus and postocellar bristles; orbits slightly converging; posterior frontorbital laterally inclined. Face one-third width of head, in profile evenly convex, slightly prominent below middle; parafacials linear; facialia not discernible, with four upcurved bristles of which the uppermost is distinctly above line of buccal orbits. Cheeks about as broad as width of third antennal segment. The latter not longer than broad, subconical, rounded apically; arista with four to five hairs. Mesonotum with about ten to twelve pairs of acrostichal setulae; both pairs of dorsocentrals approximate, the antesutural much the smaller. Scutellum slightly convex with four marginal bristles. Abdomen elongate with lateral margins subparallel; fifth segment trapezoidal, slightly longer than fourth; hypopygium narrow, twice as long as broad. Legs normal. Wings with second and third costal sections subequal in length. Length, 1.5 to 1.8 mm.

Type.—Male; Bar Harbor, Mt. Desert, MAINE, May 7, 1933. (William Proctor; on *Nymphaca advena*). [A.N.S.P., 6513].

Paratype.—1 ♂; Topotypical.

GENERA INSECTORUM, Tervueren, Belgium, has issued a list of the fascicles published to date (1902-1934), which number 199, with 489 colored plates and 136 plain plates and maps.

A List of Scarabaeidae Collected at Clemson College, South Carolina (Coleoptera).

By O. L. CARTWRIGHT, Clemson College, South Carolina.*

The species of Scarabaeidae named in this local list were collected within a mile radius of the Main Building of Clemson College, the Agricultural and Engineering College of South Carolina. Briefly described, this small area in the eastern corner of Oconee County is not unusual or very different from many other localities in North Carolina, South Carolina and Georgia. It is situated in the foothills of the southern Appalachian Mountains at an elevation varying from 600 to 845 feet. (Sassafras, South Carolina's highest mountain, 3,548 feet, lies slightly east of north, 27.5 miles away. Rabun Bald Mountain, 4,700 feet, one of Georgia's higher mountains may be seen in the northwest only 34 miles away; Satulah and other North Carolina mountains are visible on clear days). The mean annual temperature is 60.70° F. Official weather bureau records over the last 38 years have shown extremes of —7° and 104°. Frosts occur on an average about November 2 and until April 1. Rainfall is well distributed, monthly amounts varying between the averages 2.86 inches in November and 5.38 inches in February and averaging a total of 53.42 inches yearly. Snowfall averages only 2.6 inches per year. The Seneca River, boundary of one side of the area, flows into the Savannah River and thus on to the Atlantic Ocean 220 miles away. The soils, over a subsoil of Cecil red clay, are acid except in fields limed for cultivation. Natural forest is of the oak-hickory association with an admixture of short leafed pine. Willows, poplars, and some sycamores occur in the river bottoms.

The list presented has been made possible largely through determinations, verifications and other assistance by Philip Luginbill, J. B. Wallis, H. C. Fall, W. J. Brown, E. A. Chapin and R. J. Sim. All have helped the writer most generously in his study of South Carolina Scarabaeidae and their aid is gratefully acknowledged. With very few exceptions all species

* Technical Contribution No. 34 from the South Carolina Experiment Station, Clemson College, South Carolina.

have been recorded since 1925. Practically all specimens have been collected by the members of the entomological staff of Clemson College.

The list comprising 147 species of 48 genera of Scarabaeidae is as follows:

Leng No.
13038 CANTHON NIGRICORNIS (Say) Rare. 2 records 1916, 1931.
13042 C. PROBUS (Germ.) Not uncommon. Apr. 3 to Sept. 28.
13047 C. VIGILANS Lec. At light. Uncommon. May 24 to July 26.
13052 C. VIRIDIS (Beauv.) 11 records. Feb. 2 to Aug. 11.
13053 C. PERPLEXUS Lec. Rare. 2 records. May 17 and 28.
13054 DELTOCHILUM GIBBOSUM (Fab.) Rare. A single record. July 5.
13057 CHOERIDIUM HISTEROIDES (Web.) Common. Mch. 9 to Dec. 20.
13058 C. LECONTEI Harold. 7 records. June 9 to Sept. 12.
13059 PINOTUS CAROLINUS (L.) Common. Apr. 17 to Oct. 18.
13062 COPRIS MINUTUS (Drury) Common. Records every month except May, June and Nov.
13072 PHANAEUS VINDEX MacL. Not common. May 1 to Nov. 18.
13078 ONTHOPHAGUS PROTENSUS Melsh. Rare. 3 records. Apr. 9, 15 and July 16.
13080 O. HECATE Panz. Abundant Feb. 18 to Dec. 1.
13084 O. JANUS Panz. Common under rotting fungi. Jul. 6 to Dec. 3.
13084a O. STRIATULUS Beauv. Common under rotting fungi. Apr. 13 to Dec. 23.
13086 O. PENNSYLVANICUS Har. Common under excrement. Mch. 10 to Dec. 1.
21168. O. OKLAHOMENSIS Brown. Uncommon. 3 records. Aug. 24, Sept. 18 and 28.
13087 O. CRIBRICOLLIS Horn. Rare. One record. Feb. 7.
13090 O. TUBERCULIFRONS Har. 3 records. Feb. 28, Apr. 15 and Nov. 19.
13102 AEGIALIA CONFERTA Horn. Rare. One record. April 10.
13111 APHODIUS HAEMORRHOIDALIS (L.) Common. Feb. 28 to Nov. 19.
13119 A. FIMETARIUS (L.) Common every month except June, July and Aug.
13127 A. RURICOLA Melsh. 2 records. April 28 and May 16.
13131 A. GRANARIUS (L.) Common. Jan. 28 to May 1.

13132 A. VITTATUS Say. March 13 to May 1.
13134 A. LIVIDUS (Oliv.) Common. April 13 to Dec. 23.
13147 A. LUTULENTUS Hald. A fall and winter species. Nov. 13 to Jan. 23.
13148 A. STUPIDUS Horn. Nov. 13 to Feb. 18.
13159 A. RUBEOLUS Beauv. 3 records. April 15, May 1, and Aug. 21.
13161 A. CAMPESTRIS Blatchley. Rare. One record, June 23.
13162 A. STERCOROSUS Melsh. 6 records. April 1 to Dec. 1.
13180 A. BICOLOR Say. Oct. 14 to Dec. 23. Not common.
13182 A. SERVAL Say. Rare. One record. April 2.
13184 A. DISTINCTUS (Müll). Common. Nov. 13 to April 24.
13189 A. TERMINALIS Say. Not uncommon. Dec. 1 to March 1.
13201. A. FEMORALIS Say. 6 records. Feb. 10 to April 24.
13204 A. OBLONGUS Say. Rare. One record. March 14.
13216 ATAENIUS ABDITUS (Hald.) 2 records. April 19 and May 3.
13220 A. IMBRICATUS (Melsh). 4 records. May 16 to Nov. 13.
13226 A. GRACILIS (Melsh). 3 records. May 4, June 5, and 14.
13227 A. FIGURATOR Harold. 3 records. June 30, July 11 and Aug. 1.
13231 A. STRIGATUS (Say). 2 records. Apr. 28 and Oct. 14.
21219 A. CONSORS Fall. One record. July 14.
21220 A. ANTICUS Fall. One record. Sept. 28.
13263 OCHODAEUS MUSCULUS (Say). Trap light. 9 records. May 18 to Aug. 23.
13273 O. FRONTALIS Lec. Rare. One in trap light. May 29.
13277 HYBOSORUS ILLIGERI Reiche. 4 trap light records. June 7 to 23.
21231 ODONTAEUS THORACICORNIS Wallis. 3 records. April 16, Oct. 2, and Nov. 24.
21235. O. DARLINGTONI Wallis. 4 records. Jan. 3 to April 13.
13288 BOLBOCEROSOMA FARCTUM (Fab.) 11 records. June 30 to Oct. 30.
13289 EUCANTHUS LAZARUS (Fab). Trap light. April 26 to Sept. 17. Not uncommon.
13291 GEOTRUPES HORNI Blanchard. 8 records. Under fungi. May 26 to Jul. 30.
13293 G. BLACKBURNI (Fab.) Very common. Oct. 13 to March 17.
13294 G. EGERIEI Germ. Not common. 3 records. July 6, 16, and 30.

13299 G. SPLENDIDUS (Fab.) Not uncommon. July 9 to Feb. 26.
13315 LICHNANTHE VULPINA Hentz. One record. June 15.
13320 CLOEOTUS APHODIOIDES (Ill.) Trap light. April 19 to July 23.
13321 C. GLOBOSUS (Say) Trap light. May 15 to June 29.
13329 TROX MONACHUS Hbst. Common. May 13 to Aug. 27.
13330 T. ASPER Lec. 4 records. May 18 to July 23.
13331 T. SUBEROSUS Fab. 3 records. May 16, 18 and 22.
13333 T. TUBERCULATUS (DeG.) 6 records. Feb. 11 to Dec. 19.
13336 T. ERINACEUS Lec. 6 records. April 7 to Dec. 20.
13338 T. UNISTRIATUS Beauv. 2 records. May 16 and Aug. 27.
13340 T. INSULARIS Chev. 4 records. April 13 to May 21.
13341 T. TERRESTRIS Say. One record. April 4.
13342 T. AEQUALIS Say. One record. April 26.
T. sp. (A). Three records. May 18, 16 and 20.
T. sp. (B). One. 14 July.
13354 SERICA VESPERTINA (Gyll.) April 21 to May 16.
13354½ S. ATRICAPILLA Kirby. 3 records. April 21, 26 and 28.
13357 S. INTERMIXTA Blatchley. April 21 to May 13.
13364 S. SERICEA (Ill.) One record. April 16.
13364½ S. PARALLELA Casey. Common. April 16 to June 1.
13372a S. TROCIFORMIS BLATCHLEYI Dawson. 4 records. April 27 to May 31.
19959 S. LECONTEI Dawson. 3 records. April 11, May 10 and 26.
19970 S. MYSTACA Dawson. One record. April 28.
13376 DIPLOTAXIS SORDIDA (Say). Common. March 18 to Oct. 8.
13410 D. LIBERTA (Germ.) Common. March 16 to Nov. 6.
13414 D. EXCAVATA Lec. One record. May 19.
13455 D. HARPERI Blanch. Common. May 2 to July 7.
13496 PHYLLOPHAGA GRACILIS (Burm.). Common. At light. June 26 to Oct. 6.
13496a PH. ANGULATA Glasgow. One record. July 8.
13508 PH. MICANS (Knoch). Common. April 7 to July 21 (Oct. 16).
13509 PH. DIFFINIS (Blanch.). 5 records. (Jan. 6) Mch. 20 to April 28.
13511 PH. FUSCA (Froe.) 8 records. April 15 to May 26.
13512 PH. ULKEI (Smith) Common. April 21 to June 11.
13516 PH. ANXIA (Lec.) Common. April 15 to Aug. 3.

(To be continued)

The Nearctic Species of Nitela, with a Description of a New Species of Solierella (Sphecidae: Hymenoptera).

V. S. L. Pate, Cornell University.

It was not until Rohwer in 1923 described *Nitela virginiensis* that it was known this genus was represented in the Nearctic fauna. Recent examination of material at the United States National Museum has revealed the presence of another indubitably discrete species which is described herewith.

Nitela floridana sp. nov.

♀. 4-4.5 mm. long. Black. Head and pro- and mesonotum nigroaenaeruginosous; pleura and abdomen black nitidous. Clypeus apically, mandibles, palpi, antennae (flagellum infuscated apically), tegulae, and all the legs fulvous. Abdominal sternites fuscous apically.

Wings with the nervures testaceous, stigma fuscous. Forewing with the submarginal cell subrectangular, twice as long as broad.

Head opaque, microscopically shagreened; clypeus sharply tuberculate discally, rounded out and nitidously subbevelate medioapically; malar space very short, compound eyes almost reaching the base of the mandibles; eyes converging somewhat above; ocelli arranged in a high subequilateral triangle, the ocellocular line about one-third the postocellar line; the scapal basins on the front broadly and shallowly excavate; temples shining, with fine scattered punctures.

Thorax with the pronotum, mesonotum and scutellum opaque and microscopically shagreened; pronotum slightly wrinkled transversely, not carinate anteriorly, dorsal surface wide, the length about one-half the ocular line. Mesonotum without either foveate triangular impressions laterally or a fan of rugulae medioapically, subfoveolate there at most. Pleurae shining, subshagreened. Propodeum dorsally with numerous rather regular longitudinal carinulae; posterior face shining, with transverse rugulae, no cuneate enclosure but merely a longitudinal elliptical sulcus medially; lateral faces shining, with a few longitudinal rugulae.

Abdomen shining, impunctate, no pygidial area.

♂ unknown.

Holotype. ♀, Orange County, FLORIDA. March 9, 1930 (N. W. Knowles) [United States National Museum, Catalogue No. 50487].

Paratypes. FLORIDA ♀, Duval County, April 17, 1930 (R. S. Thomas) [U. S. N. M.]; 2 ♀ ♀, Hillsboro County, January 25, 1930 and March 1, 1930 (B. P. Moora) [U. S. N. M.;] ♀, Citrus County, March 12, 1930 (V. H. Robinson) [U. S. N. M.]; ♀, Volusia County, March 8, 1930 (P. A. Ausley, Jr.) [U. S. N. M]. All the material was taken by the Florida Fruit Fly Trap Survey.

Since the description of *virginiensis* a number of specimens of this species have come to hand which give an idea of the range of the species. These data are consquently recorded below together with several additional characters not given by Rohwer in his original description.

NITELA VIRGINIENSIS Rohwer.

1923. *Nitela virginiensis* Rohwer, Proc. Ent. Soc. Wash. XXV: 100; ♀.

The mesonotum has laterally on each side a triangular foveate depression; the malar space is broad, fully one-half the length of the scape; and the posterior face of the propodeum has a broad cuneate enclosure.

Distribution. VIRGINIA ♀, Chain Bridge, September 18, 1921 (J. R. Malloch) [U. S. N. M. Cat. No. 25846]; GEORGIA, 2 ♀ ♀, Milner (Tanglefoot Trap Posts), June 26, 1933 (T. L. Bissell) [U. S. N. M.]; FLORIDA, 1 ♀, Orange County (Florida Fruit Fly Trap Survey), June 12, 1929 (C. Nelson) [U. S. N. M.]; 1 ♀, Orlando, "In nests of Ants," June 15, 1908 (H. M. Russell) [U. S. N. M.]; NEW JERSEY, 1 ♀, Palisades, "Nest in dead tree", September 12, 1920 (Jos. Bequaert) [Cornell University]; NEW YORK, 1 ♀, Ithaca, July 13, 1925 (P. P. Babiy) [C. U.]

The known Nearctic species may be readily distinguished by the following key. As yet no males are known but they should be separable upon the characters given below.

Pronotum transversely carinate; mesonotum laterally on each side with a triangular foveate depression; submarginal cell rhomboidal; legs black ..... *virginiensis* Rohwer.
Pronotum rounded anteriorly, not transversely carinate; mesonotum without lateral foveate impressions; submarginal cell rectangular, twice as long as broad; legs fulvous ..... *floridana* sp. nov.

Nothing definite is known of the ethology of the American species of *Nitela*. A specimen of *virginiensis* caught by Dr. Bequaert at Palisades, New Jersey, bears the notation "nest in dead tree"; while a specimen of the same species taken by H. M. Russell at Orlando, Florida, has a label "in nests of ants." Dr. Harold Morrison of the Bureau of Entomology has very kindly supplied from its files the information that the latter specimen was collected on pecan twig and that the ant associated with it was *Crematogaster lineolata* (det. Pergande). Probably this association was a purely adventitious one. The European species construct their nests in the stems of briars or in the deserted galleries of wood boring insects and provision the nests with aphids.

Solierella (Silaon) mirificus sp. nov.

♂. 5 mm. long. Black; the mandibles whitish yellow, the apices red; antennae with the scape fulvopiceous, pedicel fulvous, flagellar segments one to seven whitish yellow, segments four to six piceous beneath, segments eight to ten piceous, apical segment fulvopiceous; an elongate transverse spot laterally on each side of the pronotum, posterior margins of the pronotal tubercles, the tegulae and axillary sclerites, the postscutellum, the tarsi, all the tibiae externally, greater part of the fore femora save basally above, middle femora apically and beneath, whitish-yellow. Head, thorax and abdomen with short appressed silvery pubescence.

Wings clear hyaline, nervures piceous. In the fore wing the basal and transverse median nervures are interstitial and the first recurrent is received by the first submarginal cell. In the hind wing, there are three longitudinal fuscous bands, the first along the anterior margin from the proximal end of the hamuli to the apex, the second and third starting from the transverse cubital nervure and running to the margin following the course of the marginal and cubital nervures respectively.

Head opaque, with fine close puncturation. Clypeus medio-apically produced, the produced portion tumid discally and obtusely tridentate apically, discally with a low, polished longitudinal ridge which becomes a sharp keel between the bases of the antennae, becoming weaker above and terminating dorsally in the apex of the V-shaped upper portion of the front which is thus formed by the deeply excavate antennal fossae; a shallow furrow from the anterior ocellus to the apex of the V-shaped upper portion of the front; a low polished ridge dorsally along the inner margins of the compound eyes. Antennae with flagellar segments one to three short and subequal, cylindrical, segments four to six becoming increasingly longer and almost square in cross section and with an increasingly longer spine apically beneath, that of the sixth over half as long as the seventh segment, seventh segment subcubical and longer than the sixth, eighth, ninth and tenth segments subcylindrical and progressively shorter, the apical segment long and tapering, fully as long as the four preceding segments, and with a deep longitudinal sulcus above.

Thorax opaque, finely punctate like the head, metapleura and lateral faces of the propodeum glabrous and shining, the latter with fine longitudinal striae; triangular area of the dorsal face of the propodeum glabrous and with a fan of fine wrinkles radiating from the posterior border of the postscutellum; posterior face of the propodeum with a deep shining perpendicular median sulcus. Anterior coxae deeply and roundly excavate internally; each anterior trochanter with a strong incurved hair.

Abdomen subshining, with fine puncturation; moderately constricted between the first and second segments; hypopygium with a subquadrate emargination apically.

♀ unknown.

Holotype: 1 ♂, 30 miles east of Quijotoa, Pima County, Arizona, 28-29 August, 1927 (J. C. Bradley) [Cornell University, Type No. 1320].

This species belongs to the *chilensis*-group and is apparently most closely related to *S. lucidus* Rohwer but may be readily distinguished from that species as well as any others of the group by the singular structure of the antennae and the anterior coxae and the pattern of the hind wing.

A New Species of Eperigone (Araneae).

By HELEN M. ZORSCH and C. R. CROSBY.

Since the revision of the genus *Eperigone* by Crosby and Bishop (N. Y. State Mus. Bul. 278, 1928) the following new species has come to hand.

Eperigone albula, new species.

Figure 1. *Eperigone albula.* A, palpus of male, mesoventral view; B, embolic division of male palpus; C, tibia of male palpus, dorsal view; D, epigynum.

♂. Length, 1 mm. Cephalothorax pale straw-yellow, broadly

oval, the sides evenly rounded the whole length, the front angles rounded, straight across the front; viewed from the side, steeply ascending behind and then gently arched to the eyes, armed with a median row of 3 stiff, erect hairs. Clypeus nearly straight, slanting slightly forward, armed in the middle with one stiff hair. Sternum very pale straw-yellow, sparsely clothed with fine, stiff, black hairs directed towards the middle. Endites oblique, convergent, tinged with orange. Chelicerae armed with a lateral row of 4 small teeth. Legs and abdomen pale straw-yellow.

Posterior eyes in a straight line, equal, the median separated by the radius and a little nearer to the lateral. Anterior eyes in a very slightly procurved line, the median smaller than the lateral, all subcontiguous.

Femur of palpus nearly straight, armed with a ventral row of 4 stiff hairs. Patella evenly convex above but slightly angulate near tip below. Ratio of length of femur to that of patella as 20 to 7. Tibia deeply excavated dorsally, the part lying next to the cymbium thin and semitransparent, the part back of the excavation produced into a stout process rounded at tip; laterally from this process there is a deep rounded excavation which is bounded on the lateral side by a thin, erect ridge. Paracymbium stout, strongly curved with a slight notch before the tip. The embolic division has the mesal face of the scaphium smooth, triangular, without a mesal tooth; the posterior tooth is lacking, the median tooth black, rectangular when viewed from below, slightly notched at tip; from the base of this tooth a black ridge extends across the body of the scaphium to the anterior tooth where the duct opens just before the beak-like tip.

Female. Length, 1.1 mm. Similar to the male in color, sometimes the abdomen is more or less darkened by the internal organs which show through the integument. The chelicerae lack the lateral row of teeth.

The epigynum is a large, slightly convex plate bounded behind by a raised brownish ridge, the receptacles show through at the sides in front.

Holotype, ♂ ; *allotype,* ♀. Tallulah, LOUISIANA, Dec. 4, 1933. Four female paratypes from the same place, Mar. 21, 1934. Collected in a Berlese funnel by Dr. J. W. Folsom.

Dates on which the Immature or Mature Sexual Phases of Ants have been Observed (Hymen.: Formicoidea).

M. R. Smith, State College, Mississippi.

Ants, because of their striking polymorphism, offer many difficulties to the taxonomist. It is especially unfortunate that practically all the keys and descriptive matter on these insects have been based on the workers. Queen ants, it is true, can very often be placed specifically with little or no difficulty because of the strong similarity which they bear to the workers. In many cases, however, this resemblance to the workers is more or less elusive and one would not be courageous but foolhardy in attempting to determine queens specifically, unless one knew that they came from the same colony as did the workers, and that they were not temporary or permanent parasitic forms.

As an illustration of the confusion existing in connection with the proper assignment of males and females to the correct species, no group of ants offers a better example than the driver or legionary ants of the subfamily Dorylinae. In this group there are numbers of species known only from one caste, such as the worker, the queen, or the male. Until the sexual phases are taken in the colony with the workers this confusion will continue to exist. Taxonomists are gradually clearing up this perplexing problem by assigning many species to synonymy as they finally link up the various castes of a species. As a typical example one might cite the case of *Eciton* (*A.*) *pilosus*, which was described by F. Smith from worker specimens in 1858. A year later Smith erected another species, *E.* (*A.*) *mexicanum*, from a collection of male specimens only. For many years the two species stood in literature until 1921 when Wheeler detected that *E.* (*A.*) *mexicanum* was the male of *E.* (*A.*) *pilosus*. Since the latter name was published first, the name *E.* (*A.*) *mexicanum* was very properly relegated to synonymy.

The males of ants are much more difficult to place specifically than either the workers or queens. At the present time one should be very cautious in assigning males to the species unless

one is very sure that they were taken along with the workers of their species. Very probably the specific determination of male ants in the future will be based almost, if not entirely, on a study of their genitalia. Even now there are certain species of ants, for example, *Paratrechina* (*Nylanderia*) sp. the workers and queens of which cannot be specifically determined except by the presence of males, and the determination of the males is based for the greater part on the genitalia.

This paper is being published with the idea that it will make known to some extent the approximate dates of the year in which the sexed forms of many Southern ants have been found. The dates of the appearance of the sexual phases of a given species will vary greatly, depending on the season, the latitude, the altitude, the topography of the soil, and other factors. However, in spite of all these, the records here given should offer some information in regard to the approximate periods in which the sexual phases are to be found.

As one will note in examining the records, the sexual phases have been taken under a number of variable circumstances, which might best be enumerated as follows: (a) periods in which both the pupae and adult stages of the sexual phases have been found in the colony or nest, (b) periods in which the male or the female, or both are found in the colony or nest, but not the sexed pupae, (c) nuptial flights, when either sex or both are leaving the nest, and (d) isolated individuals of one sex, or both, taken singly or in numbers away (remotely) from the nest, as at lights, crawling on the ground, etc. When the ants are found under condition (a) above then there is no doubt that the colony is producing its sexual phases at this time. When the ants are found under condition (b) cited above this seems to be indicative that virgin queens, and unmated males instead of taking their nuptial flight immediately are postponing it until late in the season or until the spring or summer of the following year. Colonies of certain species if examined during the winter will often be found to contain overwintering males or queens under the condition cited under (b). Nuptial flights are generally thought of as mating flights

of the sexual phases of the current year, but perhaps the only safe criterion for establishing this point would be to follow the history of the colony or else examine the nest carefully to see if sexual pupae were present. If sexual pupae were present, one could safely say that a part, if not all, of the adult sexual forms arose from pupae produced during the current season.

A large number of these observations were made by the author. In addition observations have also been made by the following: Messrs. G. W. Haug, E. E. Byrd, J. W. Ward, H. Dietrich, J. P. Kislanko, G. L. Bond, G. C. Broome and others. To these gentlemen I wish to express my appreciation for permission to publish their records.

The Alabama records given in this list were made by Dr. A. H. Sturtevant, the single Louisiana record by Professor O. W. Rosewall. I am very much indebted to both of them for the use of their records.

The symbols used below have the following meaning: M. P. means male pupae; M. means males; Q. P. means queen pupae; and Q. means winged queens.

January 1-15: Ponera opaciceps (M., Q.) McHenry; *Crematogaster ashmeadi* (M.) State College; *Camponotus caryae* var. *decipiens* (M., Q.) State College.

January 16-31: Solenopsis xyloni (M. P.) State College; *Crematogaster opaca depilis* var. *punctulata* (M.) State College; *Dorymyrmex pyramicus* (M., Q.) State College; *Camponotus caryae discolor* var. *cnemidatus?* (Q.) State College; *caryae* subsp. *rasilis* (M.) Wiggins; *C. caryae* var. *decipiens* (M., Q.) Longview; *C. castaneus* (M., Q.) Starkville; *Prenolepis* (*Nylanderia*) species (M., Q.) State College.

February 1-15: Camponotus caryae subsp. *rasilis* (M.) State College; *C. caryae* var. *decipiens* (M., Q.) Ackerman.

February 16-29: Ponera opaciceps (M.) Perkinston; *Dorymyrmex pyramicus* (M., Q.) State College; *Camponotus caryae* subsp. *rasilis* (Q.) Moss Point; *Prenolepis* (*Nylanderia*) *vividula* var. (M., Q.) Sessums; *P.* (*N.*) species (M., Q.) Sessums.

March 1-15: Leptothorax curvispinosus (Q. P.) State College; *Crematogaster victima* subsp. *missouriensis* (M.) State College; *C. opaca depilis* var. *punctulata* (Q.) State College; *Camponotus caryae* subsp. *rasilis* (M., Q.) Starkville.

March 16-31: Crematogaster opaca depilis var. *punctulata*

(Q.) State College; *Pseudomyrma brunnea* (Q.) Lucedale; *Camponotus castaneus* (M., Q.) Ocean Springs; C. *castaneus* subsp. *americanus* (Q.) Quitman; *C. herculeanus* subsp. *pennsylvanicus* (M.) State College.

April 1-15: Dorymyrmex pyramicus (M., Q.) State College; *Camponotus castaneus* (M., Q.) Starkville; *Prenolepis* (*Nylanderia*) species (Q.) Adaton; *P.* (*N.*) *parvula* (Q.) State College.

April 16-30: Solenopsis xyloni (Q. P.) State College; *Monomorium minimum* (Q. P.) State College; *Crematogaster laeviuscula* var. *clara* (Q. P.) State College, Cedar Bluff; *Iridomyrmex humilis* (Q. P.) Ackerman, (M. P., Q. P.) Columbus; *Tapinoma sessile* (M. P.) Cedar Bluff, Starkville, (Q. P.) Longview, Cedar Bluff, (M., Q.) Longview; *Dorymyrmex pyramicus* (Q.) State College; *Camponotus caryae rasilis* var. *pavidus* (M.) Cedar Bluff; *Lasius* (*A.*) *interjectus* (Q.) Chalybeate, Starkville.

May 1-15: Leptothorax curvispinosus (Q.) State College, (M., Q.) Kushla, Alabama; *Solenopsis xyloni* (M., Q.) State College, (M.) Kushla, Alabama; *Aphaenogaster lamellidens* var. *nigripes* (Q.) State College; *Monomorium minimum* (M.) Longview; *Crematogaster victima* subsp. *missouriensis* (M., Q.) Kushla, Alabama; *Iridomyrmex humilis* (M., Q.) Louisville, Columbus; *I. pruinosus* var. *analis* (M., Q.) Starkville, (M. P., Q. P.) Louisville; *Tapinoma sessile* (M., Q.) Longview; *Dorymyrmex pyramicus* (M., Q.) Kushla, Alabama; *Dolichoderus taschenbergi* var. *atterima* (Q.) Kushla, Alabama; *Lasius* (*A.*) *interjectus* (Q.) Booneville; *Prenolepis* (*Nylanderia*) species (Q.) Columbus.

May 16-31: Ponera trigona var. *opacior* (M., Q. P., Q.) Aberdeen; *Leptothorax* (*D.*) *pergandei* (M. P., M., Q. P.) Mayhew; *Solenopsis xyloni* (M., Q.) State College (Q.) Starkville; *S. picta* var. *moerens* (M.) Kushla, Alabama; *Aphaenogaster treatae* (Q. P.) Adaton; *Monomorium minimum* (M.) Starkville; *Crematogaster laeviuscula* (M.) Cedar Bluff; *C. victima* subsp. *missouriensis* (Q. P.) Cedar Bluff, State College, Mayhew; *C. lineolata* (Q. P.) Aberdeen; *Pheidole pilifera* (Q. P., Q.) Cedar Bluff; *Ph. dentata* (Q.) Cedar Bluff; (Q. P., Q.) State College, Columbus, (M. P., M., Q. P., Q.) Mayhew, (Q. P.) Louisville; *Ph. vinelandica* (M. P., Q. P.) Cedar Bluff, (M. P., M., Q. P., Q.) State College; *Pseudomyrma pallida* (M. P., Q.) Kushla, Alabama; *Iridomyrmex humilis* (Q.) Meridian; *I. pruinosus* var. *analis* (M. P., M., Q. P. Q.) State College, (M., Q.) Eupora; *Dorymyrmex pyramicus* (M. P., M., Q. P.) State College; *Camponotus caryae* (Q.) State

College; *C. castaneus* (M., Q.) Adaton, Kushla, Alabama; *C.* (*C.*) *mississippiensis* (M. P., M., Q. P.) Cedar Bluff; *Lasius* (*A.*) *interjectus* (M., Q.) State College; *Prenolepis* (*Nylanderia*) species (Q. P., Q.) State College, (Q.) Columbus.

June 1-15: Ponera trigona var. *opacior* (M., Q.) Sibley; *Leptothorax curvispinosus* (Q.) Ripley; *Solenopsis xyloni* (M. P., Q. P., M., Q.) Columbus, Wiggins (Q.) Columbus (M., Q.); *Aphaenogaster lamellidens* var. *nigripes* (M.) Starkville; *A. fulva* subsp. *aquia* (Q.) Ripley; *Crematogaster laeviuscula* (M., Q.) Ripley; *C. victima* subsp. *missouriensis* (M., Q.) Columbus; *Pheidole dentata* (M. P., Q. P., M., Q.) Starkville; *Iridomyrmex humilis* (M.) Columbus; *I. pruinosus* var. *analis* (M., Q.) Columbus, Ripley; *Prenolepis* (*Nylanderia*) species (*M.*) Starkville.

(To be continued.)

Capture of a Species of Colaenis New to the United States (Lepid.: Nymphalidae).

Lately I received from a sister in England a book entitled "The Butterflies of the British Isles" by Richard South, F. E. S. It is a handy little volume containing excellent colored plates illustrating all the species, together with many of the caterpillars and chrysalids as well as the plants upon which they feed. The author states in preparing the book he has been largely guided by a recollection of the kind of information he sought when he himself was a beginner, now some fifty odd years ago. Many captures are reported, with date and locality for the various species.

I believe it would be desirable to obtain, for this country too, a more complete knowledge of the distribution, habits and dates of occurrence of our butterflies. Entomologists should be encouraged to report their captures, especially their rarer ones. Published lists, such as that of Virgil F. Calkins which recently appeared in this periodical, are especially to be commended.

With this prelude I wish it to go on record that on December 19th, 1933, I captured at Sarita, Kenedy County, Texas, a perfect specimen of *Colaenis phaetusa*. This is a gaudy insect and even a novice would recognize it as belonging to the Colaenis group. As far as I am able to ascertain this is the first recorded capture within the United States. Dr. Benjamin, who made the identification, says he knows of no previous record of its capture for our region. A. Avinoff says the finding of *C. phaetusa* in the limits of the States is certainly a remarkable addition to the fauna of this country.

Apart from the thrill of the capture, what interests me most is, how it came to be so far from its habitat; it must be borne in mind this is a perfect specimen, it would appear to have just emerged from the pupae. Avinoff considers it a wind-blown specimen from Mexico, but remarks, "one would surmise it would be battered and worn and that is why it seems remarkable your specimen is in such a good state of preservation." The writer has had a good deal of experience with wind blown specimens from Mexico, such as *A. amryllis, A. fatima, A. petreus,* and others, but they have always been battered and torn, for this reason I am prone to accept the wind blown theory, and I think John A. Comstock's opinion about solves the problem, when he says, "I see no reason why an original wind blown female specimen from Mexico may not have planted a colony, from which your specimen hatched, especially as other members of the genus feed on *Bassiflora* and think it is safe to presume that it is also one of the Passion Vine feeders, a plant that is common in Texas."

H. GLAZBROOK, Sarita, Texas.

Larva of Nathalis iole Boisd. (Lepid.: Pieridae).

Having reared most of the butterflies found here, I became very desirous of rearing *Nathalis iole.* I had read, or been told, that its food plants were spanish needles and wild marigold but no amount of searching ever led to finding larvae on either of these plants. One day, lifting a chickweed plant which grew by the roadside, I saw a larva feeding and, as in everything but size and in having a rosecolored mid-dorsal stripe it resembled a sulphur larva, I judged it must be near the sulphurs and, as it seemed to be full grown, knew it must be a dwarf, so at once thought "this may be *iole.*" It very soon pupated and later the *iole* butterfly emerged. Later, in October I think, I watched a female ovipositing on chickweed, and secured an egg, finding it light yellow, smooth and spindle shaped.

In the summer of 1933 no *iole* were seen flying until mid August. The first eggs were secured September 20th on robust chickweed plants at the edge of a sandy bean field. The first egg hatched September 22d and the larva was light green with black head and two rows of bristles on dorsal side. It was very difficult to determine the first moults, owing to the very small size of the hatchling, but on October 7th a moult, probably the first, occurred and then the pink mid-dorsal stripe appeared. The next, 2d moult, appeared to be on October 17th and now the larva was quite rosaceous. On the 22d, at 3d

moult, it was 3/8 inch long and very pink. Owing to frosts and scarcity of food supply, the larva did not become a pupa until November 12th, remaining a long time horizontally suspended on a silk mat and supported by a silk thread. The pupa was largely rosecolor at first, later changing to a mealy russet. Other pupae were green or yellowish changing to almost black.

LULU M. BERRY, Vinton, Iowa.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The **figures within brackets** [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

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leras, J.—Algo mas sobre la fecha de publicacion de los Carabidos del "Voyage" de D'Orbigny. [104] 6: 37-38.

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The Macrolepidoptera of the World. Engl. Ed. By A. Seitz. Vol. 6. Fauna Americana, pp. 1065-1072, closes the index to the original descriptions of the Notodontidae and begins the text of the family Megalopygidae, by Walter Hoff; also includes plates 98F, Sphingidae and 152, Notodontidae. Vol. 10, Fauna Indoaustralica, pp. 897-909, closes index to this volume and includes title-page and index to the plates. (The above have just been received at our office.)

OBITUARY.

The undersigned regrets to announce the decease of Professor Dr. ANGEL GALLARDO, ex-Director of this Museum (1911-1916) and lately Honorary Chief of the Section of Entomology, which occurred suddenly on May 13 last.

The obsequies of Prof. Gallardo, in which the supreme authorities of the government took part, gave place to an imposing manifestation of national grief in homage to his eminent personality (former Minister of Foreign Affairs, Ambassador of the Argentine at Rome, Rector of the University of Buenos Aires, etc.) and whose scientific work in Entomology and general Biology is well known. The *Anales del Museo* will publish his biography in the near future and for this purpose the undersigned will heartily thank those persons who, having had relations, scientific or otherwise, with Prof. Gallardo, will send to him letters or information concerning the deceased.—MARTIN DOELLO-JURADO, Director of the Museo Argentino de Ciencias Naturales, Casilla Correo 470, Buenos Aires.

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